

## Exploring the Role of Fiscal Decentralization in Capital formation: Empirical Evidence from Pakistan

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### Abstract

The purpose of this paper was to investigate the impact of Fiscal decentralization on capital formation. Time series data from 1980-2018 were used for the assessment of the model through Auto Regressive Distributed Lag modelling technique. Empirical outcomes corroborated that government development expenditures had significant positive impact on capital formation in Pakistan. The impact of government expenditures on economy is seemed to be a very important element for economic progression in democratic countries. This study result indicates that it is vital for the Pakistani government to adopt the policy of increase in government expenditures in order to attain higher capital formation, a precondition for growth and development of the country.

**Keywords:** Fiscal Decentralization, Capital Formation, Expenditures Regime, Time Series, Co-integration, Pakistan

### Introduction

Capital formation plays a key role to achieve economic efficiency through production and employment. Capital formation is the process of increase in stock of capital and investment on capital goods. At present, the scenario of capital formation is differentiated due to the involvement of central and provincial governments regarding the liability of planning, choice, resource allocation and funds raising. Fiscal decentralization is accounted as root cause of fluctuations in capital formation procedure. Globally, the concept of decentralization has got prime importance in the last two decades (Rondinelli and Cheema, 1983). It incorporates the smaller units of federation to take part in the economic development of a country and at the same time also attempts to achieve the national level tasks. It strengthens the smaller productive units to be more efficient and innovative.

For the economic stability and equity Fiscal decentralization is counted as an effective strategy as it helps in better resource allocation as well as policy implementation. It indirectly affects the drivers of growth like capital formation, savings, and level of employment. It is basically the process of funds transfer from national to state level and in addition the allocation of planning responsibility, resource allocation, funds generation and administrative controlling authority (Rodinelli and Cheema, 1983). The developing countries have embraced the fiscal decentralization to dominate the virtues from decentralization as population participation, democracy, awareness, accountability and equity for all (Crook and Sverrisson, 2001). If local administrations and private authorities are to perform decentralization functions efficiently and effectively, must have a suitable amount of revenues to allocate the available resources properly and also have the authority about expenditure (World Bank, 2001).

Fiscal decentralization is basically aimed to reduce poverty in the economy. Poverty mitigation had not been a leading drive for decentralization as it had not played any significant role in poverty reduction (Steiner, 2005). Some studies had focused on the impact of fiscal decentralization on economic development (Bahl, 1999). In the existing literature, a few studies have focused on the impact of fiscal decentralization and poverty alleviation (Braun and Grote 2000 and Jutting *et al.*, 2004). Fiscal decentralization may empower minorities and exposed segments to take part in the de-

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velopment process at local level (Kyei, 2008). The involvement of local people in the decision making transparency in the resource allocation will ultimately lead to positively effect on poverty reduction (Dinye *et. al.*, 2002).

Fiscal decentralization is also a source to ease financial burden from national level and also a foundation of revenue for central government through taxation. Fiscal decentralization acts as a better policy instrument because local authorities better understand the core issues and higher return from investment in the sectors. On the other hand accountability and equity strengthens the process of Fiscal decentralization because poor are also strengthened from it (Conyers, 2000).

The paper is structured into six parts as first, second, third, fourth, fifth and sixth namely, Introduction followed by literature review, Theoretical background and data description, Empirical model, Analysis and results and discussion and policy implications and agenda for future research respectively.

### Literature Review

Being an important determinant of economic efficiency and optimum resource allocation, fiscal decentralization got significant attention across the globe. Most of the developing countries followed the practice of Fiscal decentralization as tool for poverty reduction and employment generation. The practice of Fiscal decentralization can be more favorable because provincial governments know well about their economic scenarios and hence an effective planning and implementation can be programmed. A brief literature for the current issue is mentioned as follows:

Jin and Zou (2005) discussed fiscal decentralization, revenue, expenditure and economic growth in China. The study used a panel dataset for 30 provinces to analyze the relationship between Fiscal decentralization and economic progress over two regimes in China. First for 1979-1993 under fiscal contract system, and secondly, from 1994-1999 under tax assignment system by using fixed effect estimation technique for econometric analysis. The study concluded that revenue decentralization promotes revenue generation and economic growth. The effect of fiscal decentralization depends on the nature of the fiscal institutions and political system.

In a study, Malik *et al.*, (2006) studied fiscal decentralization and economic progress nexus for Pakistan using data from 1971-2005. The study using OLS estimation method found mixed results i.e. (RPEC) the ratio of sub-national government expenditure's to total government expenditures and (RPRCA), sub-national level revenues minus grants-in-aid to Total government revenues ratio had positive impact. While the variable (RPRC) of sub-national government revenues to total government revenues ratio reported negative effect. Their study suggested that central government should undertake the fiscal responsibilities at the initial phase of economic development. Provincial government revenues and expenditures grow continuously that can slow the pace of growth.

Potential link between fiscal incentives, public spending productivity Zhejiang province of China had been investigated by Stefan (2013). The study used the panel data during the period 1995 to 2005 by using stochastic frontier and spatial error correction. The study indicated that revenue and expenditure decentralization promote allocative efficiency. The study suggested that the impact of fiscal incentives decreases as income inequality rise among county governments.

For the economic stability and to earn foreign exchange exports sector is of prime importance. But exports sector is also controlled by the government as some restrictions are imposed like tax rate and quota system etc. Still exports play an important role in the growth of a country. Bagwati (1973) also determined positive relationship between exports and economic development. Similarly, Marshal in (1890) also concluded that the economic progress of a nation was associated with its exports sector.

Poverty and income inequality reduction are considered as main targets for every government. Faridi *et al.*, (2012) analyzed the impact of fiscal decentralization on poverty, inequality and employment in Pakistan. The study based on the time series data from 1972-2009 and OLS estimation technique for econometric analysis. The results showed that expenditure decentralization has significant and positive effect on employment generation in Pakistan but revenue decentralization is not feasible for employment generation. The Study suggested Fiscal decentralization as important element for employment generation in Pakistan.

Agriculture sector is leading in terms of value added, employment and exports for Pakistan. Ali (2004) found that it had developed at the rate of 4 percent per year since 1960. Government investment in this sector has dropped relative to total expenditures. Investment on agriculture sector decreased from 52 percent in the second Plan of 1960-65 to 18% in ten years development Plan of 2001-2011 (Government of Pakistan, 2007).

The growth effects of fiscal decentralization and democratic institutions in Pakistan had been explored by using time series data over 1972-2010. GMM estimation technique was used for econometric analysis and the study showed that decentralization of revenue is growth enhancing in Pakistan if focused on composite decentralization and high institutional quality, that will be supportive for sustainable economic progress (Iqbal *et al.*, 2013).

The impact of Fiscal decentralization on economic growth of Pakistan had been tested using Autoregressive Distributed Lag Approach (ARDL) for estimation on data from 1972-2012. The results showed the negative effect of Fiscal decentralization on economic growth suggesting that proper management regarding fairness and corruption free measures are required to make the centralize process effective (Shahid and Amjad, 2015).

Some recent studies also found that fiscal decentralization is associated with less income inequality. Stossberg and Blochliger (2017) analyzed the impact of fiscal decentralization on income inequality in OECD countries. Results revealed that stronger and smoother the process of Fiscal decentralization, lesser will be the income inequality.

Blochliger and Akgun (2018) also reported positive and significant relation amongst Fiscal decentralization and economic progress in OECD countries. They focused on revenue decentralization as tax revenues tend to have a stronger impact than spending decentralization in case of small economies and government.

These studies have found positive as well as negative effect of Fiscal decentralization on economic progress through different channels. However, capital formation is one of the important factor(s) to be targeted by fiscal decentralization process. Impact of fiscal decentralization on capital formation is hardly found in case of Pakistan. The present study is an attempt to fill this gap and to suggest a better policy. Capital formation got prime importance because the largest factor governing productivity in a country is its richness or poorness in capital formation procedure.

The motivation behind this research is a single sentence from Indian Planning Commission Report that “The key to attain higher productivity and increasing income and employment level lies really in striding up the rate of capital formation”. This deficiency in the existing literature is a rationale to conduct this particular research.

### Methodology

There are two ways commonly used to measure the degree of fiscal decentralization these are expenditures and revenues shares of local governments to the central government. This analysis uses expenditure approach by following Davoodi and Zou (1998), Zhong and Zou (1998) and Xie *et*

al., (1999). Under the expenditure approach, Fiscal decentralization has been defined as share of associated provincial expenditures to the total expenditures by central government. Higher the share of provincial government's expenditure in comparison with total expenditures shows the higher degree of fiscal decentralization.

Following Barro (1990) and Zhang and Zou (2001) an endogenous growth model consists of production function with several inputs where capital formation is used as proxy for output.

$$Cf = AK^{\alpha}L^{\beta} \quad (1)$$

Where CF is the Gross capital formation, L is labour input, K is capital input and A is the level of technology. With the addition of new variable Fiscal Decentralization (FD), the production function takes the following functional form.

$$CF_t = f(K_t, L_t, FD_t, T_t) \quad (2)$$

After some manipulation equation (2) becomes as follows:

$$\frac{\partial CF_t}{\partial FD_t} = A\gamma_1\beta e^{ct} Kt^{\alpha} Lt^{\beta} FD_t^{\gamma_1-1} \quad (3)$$

This equation shows the change in capital formation due to change in fiscal decentralization. This effect of Fiscal decentralization on capital formation is highlighted in the present study.

The economic impact of fiscal decentralization on capital formation is mostly focused on investment in capital goods that includes both physical and human capital. The aim of this capital formation is to increase efficiency, proper resource allocation, poverty reduction and employment generation. The model given below is used as a baseline for the current analysis.

$$CF = f(DEXP, EXP, AGR) \quad (4)$$

Where CF is the gross capital formation annual percentage of growth used as proxy for investment, DEXP is the development expenditures as percentage of GDP, EXP is the exports and AGR is the agriculture value added are used as control variables supported from literature. Data for the current study have been taken from several resources including World Development Indicators, "Pakistan Economic Surveys and State Bank of Pakistan".

Econometric form of model is written as:

$$CF_t = \beta_0 + \beta_1 DEXP_t + \beta_2 EXP_t + \beta_3 AGR_t + \mu_t \quad (5)$$

This model is estimated to examine the influence of FD on capital formation.

## Results and Discussion

The first step in the analysis is to check for the stationarity characteristics of the data. On the basis of stationarity level, several econometric techniques are applied. To check the stationarity two tests are mostly used as Augmented Dickey Full Test (ADF). Unit root test results are presented in the table 1.

**Table 1. Stationarity testing with ADF Test**

Variables	Level	First difference
CF	1.58	4.94**
DEXP	2.29	5.88**
TO	0.39	4.79**
AGR	-4.72**	5.10

Note: \*\* denotes significance at 5 % level

This table shows the variables have mixed order of integration. In case of mixed order of integration with no variable I (2), than, the Pesaran (2001) bound testing gives better results than all

other techniques (Afzal *et al.*, 2013). The next step is to choose the optimal lags for the variables because lag length determines the dynamics of the series. It is important to take lags to make the model free from problems like serial correlation.

**Table 2. The Lag Length Selection**

Lags	LR	AIC	SC	HQ
0	NA	14.135	14.33	14.19
1	103.68*	10.43	11.39*	10.71*
2	23.39	10.28*	12.03	10.79

Note: \* denotes the lag length chosen by each criterion

This is clear from table 2 that optimal lag length selected is 1. This is indicative of no serial correlation using serial correlation LM test. The next estimation step is to test for the presence of long run co-integration between the variables. Bound testing approach is reliable in case of ARDL model. Given below are the results of Bound Test.

**Table 3. The Bound Test for Co-integration**

Specification	Lower Bound	Upper Bound	F-Statistic	Decision
CF/ DEXP, TO, AGR	3.272	4.306	7.210	Cointegration
DEXP/ CF, TO, AGR	3.272	4.306	-----	No Cointegration
TO/ CF, DEXP, AGR	3.160	4.190	-----	No Cointegration
AGR/ CF, DEXP, TO	3.272	4.306	-----	No Cointegration

Note: Computed critical bound values are obtained from Pesaran *et. al.*, (2001)

These results show that the value of calculated F-statistics 7.21 is greater than upper and lower bound critical values 3.272-4.301 which shows the presence of long run relationship among the variables. The next step is to compute the long run relationship between dependent and explanatory variables. Equation 5 is estimated to study the impact of FD on capital formation for Pakistan.

**Table 4. Long run Coefficient Estimates**

CF <sub>t</sub>	=	14.571	+	1.76DEXP <sub>t</sub>	+	1.14TO <sub>t</sub>	-	0.89AGR <sub>t</sub>
t-statistic:		(2.588)		(2.434)		(6.057)		(-3.276)
P-value:		(0.027)		(0.035)		(0.0001)		(0.008)
R <sup>2</sup>	0.95,	Adjusted R <sup>2</sup>	0.88,	D-W-stat	2.68,	F-statistics	14.21	(0.000)

Note: values in Parentheses are t- statistic and probability values

These results show that in long run Fiscal Decentralization have positive and significant relation with capital formation. As one percent increase in capital formation increases development expenditures by 1.76 percent. These findings are in line with Esteller and Sole (2005) as fiscal decentralization promotes the level of investment and it improves the infrastructure and hence welfare of the people. These findings are consistent with the findings of Qichun & Meng, (2018) as expenditure decentralization increases the investment in china. Also similar results were found by Jia *et al.*,

(2014) that expenditure decentralization increases the level of government's total expenditure and level of investment. Trade openness used as control variable reported positive and significant relation with the capital formation. These findings are in lined with Marshal (1890) and Bagwati (1973). Another variable is agriculture value added shows negative and significant relation with capital formation. Ali (2004) also found similar result because government investment to agriculture sector decreases from 52 percent to 18 percent from 1965-70 to ten years plan 2001-2011.

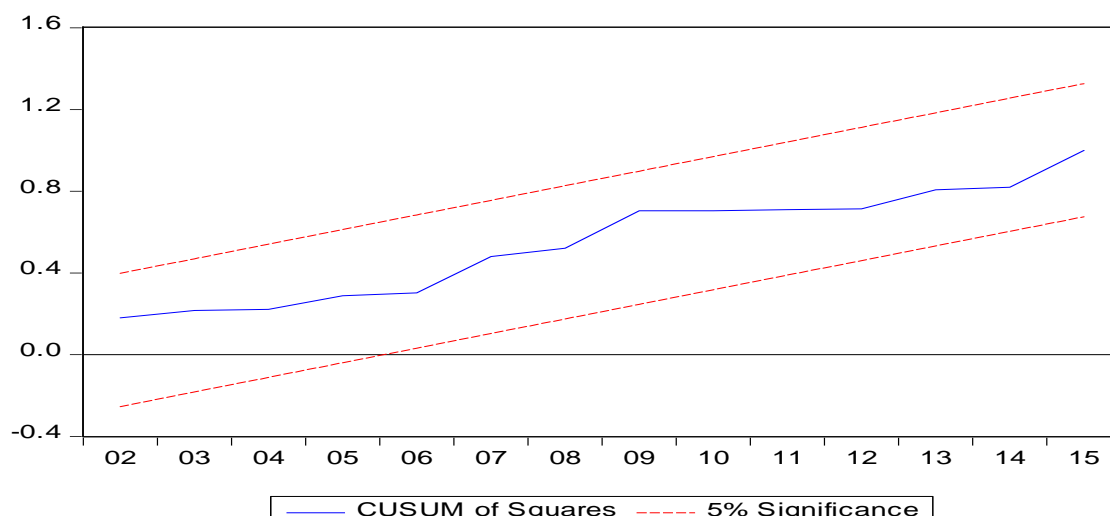
This paper utilizes Langrage multiplier (LM) test for serial correlation and it is better choice when the variables are correctly identified and in case of normality assumptions it is sensitive. Normality test is used to confirm the normality condition in the model. White test is applied for heteroscedasticity whereas Ramsey's test to check the functional form. Results of these tests are given below:

**Table 5. Diagnostic Tests**

Test Statistics	F-Statistic	Prob. Value
Langrage Multiplier (LM) Test	5.00	(0.082)
Ramsey's test	0.10	(0.75)
Jarque- Bera test	0.57	(0.75)
Breusch-Godfrey test	18.11	(0.15)

Note: Values in Parentheses are probability values

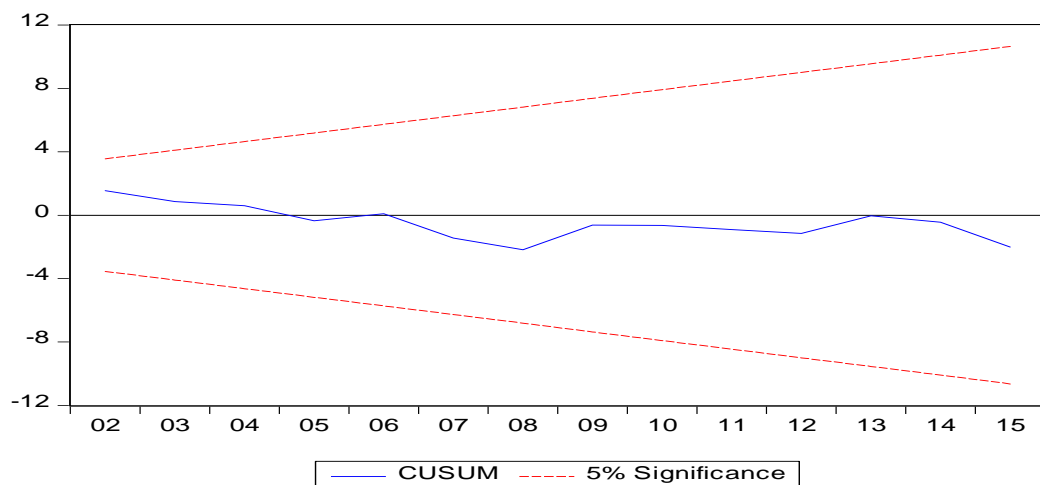
These results showed that the model is free from the problem of serial correlation, heteroscedasticity and functional form and is stable at 5% significance level. Results in the table showed that calculated F-statistics is greater than upper and lower bound critical value which means there exists long run cointegration among the variables (Pesaran *et al.* , 2010).



**Figure 1. Plot of Cumulative Sum of Recursive residuals (CUSUM)**

Figure 1 and Figure 2 represent the CUSUM and CUSUMQ plots to check for existence of any structural breaks. In both cases, the possibility of any structural instability has been ruled out for estimated model.





**Figure 2. Plot of Cumulative Sum of Recursive residuals (CUSUM Q)**

### Conclusion and Policy Implication

The key objective of this study was to assess whether government development expenditures increases capital formation or not. Results revealed that there is positive and significant relationship between Fiscal decentralization and capital formation, as increase in government development expenditures increases the capital formation in Pakistan.

This study suggests that if government increases development expenditures, overall capital formation also increases. As capital formation refers to increase in stock of capital and investment in both physical and human capital. Therefore, productivity, efficiency and employment level can be increased through capital formation and fiscal decentralization is one of the major tools for capital formation. It is recommended that idea of raising development expenditures to create more capital can be beneficial for the economy regarding the productivity and level of employment. This is because provinces are differentiated on the basis of assets structure and capital formation. Another dimension of development expenditures can also be linked with per-capita income, poverty, inequality and infrastructure development that can be rewarding for knowing that how fiscal decentralization to be supported for economic development.

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